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ABSTRACT

The suitability of single subject designs for research on coping skills training is discussed. Such training programs teach the individual an active skill for dealing with anxiety-provoking situations. Several research strategies are reviewed, with a discussion of their major assumptions and their potential for testing for generalized effects: (1) reversal, or withdrawal of the treatment condition; (2) simultaneous treatment, in which different interventions are compared; (3) changing criterion, in which stepwise change in behavior is associated with each phase of treatment; and (4) multiple baseline, in which baseline data are first stabilized on several subjects; the behavior of the experimental subject does not change until he or she is exposed to the treatment condition. It is concluded that the multiple baseline design is the most appropriate strategy for single subject coping skills training. (Author/GDC)

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# The Applicability of Single Subject Designs for Research on Coping Skills Training

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## Abstract

The present paper discusses the suitability of single subject designs for research on coping skills training for the management of anxiety, i.e., techniques which teach the individual an active skill for dealing with a variety of anxiety-provoking situations. For each design, the major presuppositions are cited and the design's potential for testing the assumption of generalized effects is examined. The single subject strategies reviewed are the reversal, simultaneous-treatment, and multiple baseline designs. The review indicates that the multiple baseline across subjects design is the most appropriate for examining coping skills training programs. Potential assessment procedures for evaluating coping skills training programs are discussed and recommendations are made for the measurement of target behaviors and generalized effects.

# The Applicability of Single Subject Designs for Research on Coping Skills Training

Early behavior modification research has been characterized as being predominantly focused on discrete, situation-specific responses. For example, the hierarchy themes constructed in desensitization were often very circumscribed. Behavioral assessment frequently consisted of diagnosing the client in a piece by piece fashion and assigning problem-specific treatment procedures for partitioned behavioral dysfunctions (Cautela, 1969; Mahoney, 1974). Recently a number of individuals (Cautela, 1969; Goldfried & Merbaum, 1973; Mahoney & Thoresen, 1974) have suggested that in addition to removing the maladaptive behavior present in the individual when he comes for treatment, the behavior therapist should attempt to make the individual less susceptible to the development of future maladaptive behaviors and provide means for the individual to eliminate any such maladaptive behavior without the aid of the therapist. As a result of this movement toward preparing the client for dealing with future tensions, the area of coping skills training has emerged among behavior modifiers.

Several techniques are purported to be coping skills training. Among these are self-control desensitization (Goldfried, 1971), cue-controlled relaxation (Russell & Sipich, 1973), anxiety management training (Suinn & Richardson, 1971), applied relaxation (Chang-Liang & Denney, 1976; Deffenbacher, 1976), and stress inoculation (Meichenbaum & Cameron, Note 1). A fundamental assumption common to all of the above techniques is that the client is taught an active coping skill which can be applied in a variety of anxiety provoking life-situations. Thus proponents of these techniques contend that their treatment packages are superior to traditional desensitization and implosion therapy with regards to generalization and prevention (Barrios, 1978; Goldfried, 1971; Russell, Miller, & June, 1975). Unfortunately this generalization assumption has not been adequately tested (Barrios, 1977). A primary reason for the lack of confirmatory data has been the failure on the part of researchers to recognize certain methodological factors that may influence the results of experiments or their interpretation. Another potential factor responsible for the absence of supportive or nonsupportive data is the omission on the part of coping skills researchers to conduct intensive investigations on a single subject or group of subjects. The present paper attempts to discuss the suitability of single subject designs for research on coping skills training.

For each design the major presuppositions are cited and effects which are relevant to the applicability for testing the generalization assumption are examined. Finally, potential assessment strategies for evaluating coping skills training programs are discussed and recomendations are made for the measurement of target behaviors and generalized effects.

A-B-A-B design

The A-B-A-B or withdrawal design (Leitenberg, 1973) utilizes alternative presentations of the baseline and experimental conditions within a subject or group of subjects. The withdrawal of the treatment condition is an essential ingredient in this design. Only such a phase can demonstrate the controlling effects of the experimental condition over the target behavior. This design, also referred to as an "equivalent time samples design" by Campbell and Stanley (1966), is very powerful and renders unlikely several rival explanations that may account for behavior change (Kazdin, 1973).

Despite the design's utility and power, it does make the major presupposition that the behavior changes produced are reversible when baseline conditions are reinstated. In order to demonstrate a functional relationship between the presence of the experimental condition and performance, it is necessary that the behavior changes produced are of a transient and therefore reversible nature.

In coping skills training, the client is taught an active skill which can be used for both remedial and preventative purposes (Barrios, 1977). It is improbable then that the behavioral changes made in coping skills training are reversible when the experimental condition is withdrawn. The effects of a coping skills training program are intended to be nontransient, resistant to extinction, and generalizable. For these reasons it is apparent that the A-B-A-B design is inadequate for studying the nontransient effects of coping skills training. If such a design were employed, the effects of the treatment condition would not be clear because of the nonreversal of effects during the return to baseline phase. In order to facilitate obtaining a reversal of effects Bijou, Peterson, Harris, Allen, and Johnston (1969) have recommended using short experimental periods. This recommendation is useful when the goal is to determine short term effects of treatment conditions. However, the A-B-A-B design is inadequate when investigating nontransient effects such as those produced by coping skills training. Because of the nonreversible nature of the behavior changes produced by coping skills training, it is difficult to

demonstrate experimental control with this design. In order to clearly demonstrate the efficacy of coping skills training, designs which require no reversal of conditions should be employed.

Changing criterion design

The changing criterion (Hartmann & Hall, 1976) is a variant of the multiple baseline design. The design requires initial observations on a target behavior or behaviors, followed by implementation of a treatment program in each of a series of treatment phases. A stepwise change in criterion rate for the target behavior is associated with each treatment phase. Thus, each phase of the design "acts" as a baseline for the succeeding phase. Therapeutic change is replicated and experimental control is demonstrated when the rate of the target behavior changes with each stepwise change in the criterion.

Successful implementation of the changing criterion design requires particular attention to three design factors (Hartmann & Hall, 1976): (a) length of baseline and treatment phases, (b) magnitude of changes in the criterion, and (c) number of treatment phases or changes in criterion. Demonstration of experimental control is best shown by a visual display of the close correspondence between behavior rate and changes in the criterion.

The changing criterion design is most applicable for treatment problems which can be modified in a stepwise manner and where reasonably prompt changes to a new stable level are expected in response to changes in the criterion. Case studies on coping skills training (Barrios, in press; Deffenbacher, 1976; Reeves & Mealiea, 1975) indicate that behavioral changes do not occur in stepwise fashion. Instead, a negatively accelerating function more accurately describes the modifications in performance. Techniques such as traditional desensitization (Wolpe, 1969), participant modeling (Bandura, Blanchard, & Ritter, 1969), and reinforced practice (Leitenberg & Callahan, 1973) appear more amenable to employment of the changind criterion design. Coping skills training programs do not include the systematic "working through" of a hierarchy such as traditional desensitization. Therefore it is unlikely that the stepwise changes and stable levels required for demonstrating experimental control with the changing criterion design could be achieved with coping skills training.

Simultaneous-treatment design

The simultaneous-treatment design (Kazdin, 1977; Kazdin & Hartmann, in press) permits the examination of the effects of different interventions that are implemented in

the same phase. By systematically varying the stimulus conditions across the interventions the effect of each intervention is determined. The balancing of interventions across different conditions of administration allows the experimentor to seperate the intervention effects from these other conditions. The primary advantages of the simultaneous-treatment design (Kazdin & Hartmann, in press) are: (a) it permits comparison of different interventions concurrently implemented in a single treatment phase for a single subject; (b) it does not require a reversal or return to baseline conditions to demonstrate the effects of the interventions; and (c) it may provide useful information beyond the effects of seperate interventions (i.e., assessing client behavior across different time periods and staff members).

Kazdin and Hartmann (in press) describe the primary considerations in utilizing the design. The simultaneous-treatment design is best suited to a special set of circumstances. The utility of the design depends upon several factors such as the type of target behavior, number of interventions compared, and the discriminability of the different interventions and the stimulus conditions that are balanced across interventions. In order for the design to demonstrate behavior changes across different daily sessions or time periods, the target behavior must shift rapidly as the intervention is changed at different points in time. Thus, interventions must not have strong carry-over effects after they have been terminated. A comparison of the relative effectiveness of different interventions is rendered impossible if a treatment has lingering effects which contaminate the intervention that follows it.

With regards to coping skills training programs, it is improbable that the active strategies taught to the individual will not carry over into different settings and behaviors. In fact, it is the primary intent of the treatment programs that such generalization effects do occur. Strong carry over effects from one treatment are likely to contaminate the behavior changes produced by another; thus making interpretation of the results difficult. A possibility does exist which would make the simultaneous-treatment design acceptable for research on coping skills training. If the individual were able to exert voluntary control over the application of the skills, it may minimize the contamination of the results due to carry over effects. However such a possibility seems remote. During the course of repeated assessment, the individual will probably select and exclusively apply the technique which produces the greatest decrements in anxiety. Self-control techniques such as thought-stopping (Cautela & Wisocki, 1977) and self-monitoring (Kazdin, 1974) are more likely candidates for

investigation with the simultaneous-treatment design.

Multiple baseline designs

An alternative to the A-B-A-B, changing criterion, and simultaneous-treatment designs is the multiple baseline design (Baer, Wolf, & Risley, 1968). In this design there is no reversal of conditions required to demonstrate the efficacy of the experiemntal condition. Instead, data are collected across behaviors, across individuals, or across situations. In multiple baseline design across individuals, baseline data are gathered for at least one behavior across several persons. After stable baselines across subjects are achieved, one subject is exposed to the experimental condition while baseline conditions are continued for the other subjects. As the experimental condition is extended to include seperate subjects, the target behavior(s) changes. Experimental control is demonstrated when the behavior of a subject does not change until s/he is included in the treatment condition.

The multiple baseline design across individuals appears appropriate for investigations of the effects of coping skills training. The design is capable of demonstrating generalized effects and, most importantly, experimental control. An example which employs a multiple baseline design across individuals is presented below.

In the present example, the effects of coping skills training were examined in a multiple baseline analysis in three adult female clients suffering from multiple anxiety reactions (i.e., rat, spider, and dog phobias). Following baseline assessment all clients received six 40 minute sessions of coping skills training. Consistent with multiple baseline strategy, training was applied sequentially to the three clients. Behavioral assessments of approach behaviors were conducted once a day. 1 The results of the multiple baseline analysis are presented in Figure 1. The sequential introduction of treatment resulted in considerable increases in approach behavior. The effects of treatment were not confined to a particular phobic behavior. Decrements were observed in all three of the phobic behaviors. More importantly, changes in a client's phobic behavior did not occur until she was included in the experimental condition.

One major aspect may make this design problematic. If it is possible that the alteration of the behavior of one subject will influence the behavior of other subjects, the design loses power. In this situation, implementation of the experimental condition for the first subject may dramatically alter the behavior of another subject for whom

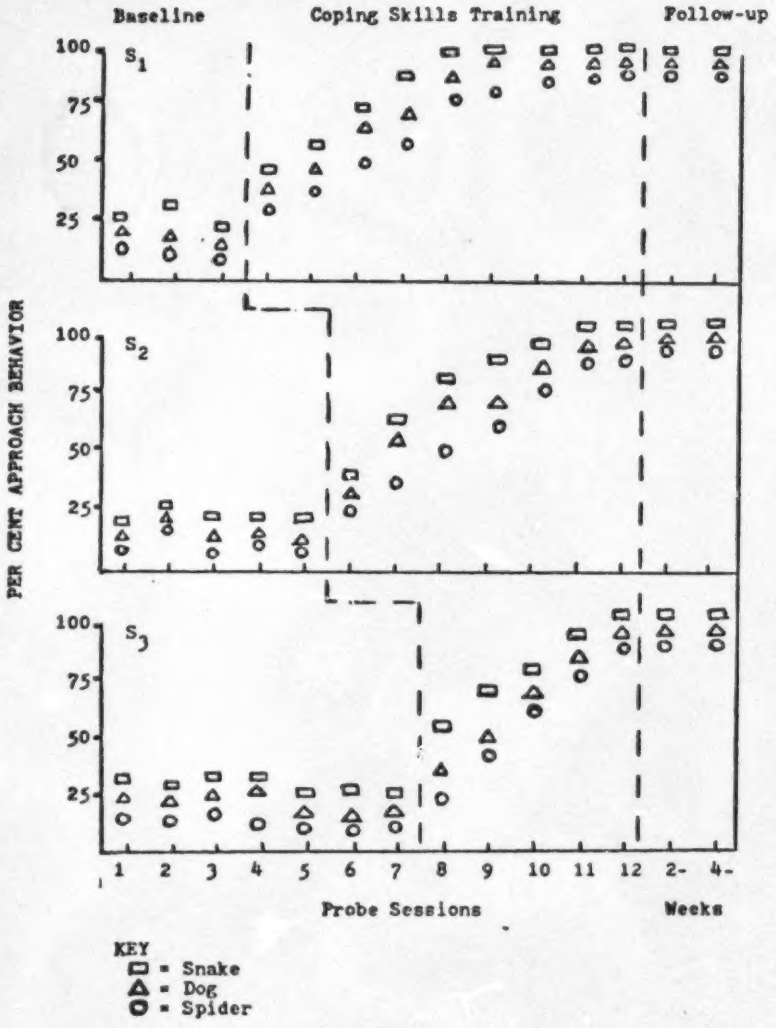


Figure 1. Illustration of the multiple baseline design across individuals for use in coping skills training research. Assessment sessions during baseline, treatment, and follow-up for the three clients.

baseline conditions are continued (Kazdin, 1973). Such an issue is of major concern for those researchers dealing with classroom or ward management. It is unlikely that in coping skills training, where the clients are generally seen on an individual basis, that such a situation would emerge. However, this independence requirement does eliminate the use of multiple baseline designs across situations and behaviors for research on coping skills training.

General discussion

Although the multiple baseline across individuals is most appropriate for coping skills training research, the successful application of the design depends upon prior knowledge concerning key characteristics of the target behaviors. For example, relatively precise estimates of generalization lag must be known in order to schedule successive applications of treatment across individuals. Obviously not all behaviors will change at the same rate. Therefore it is necessary to obtain estimates of not only the magnitude of effects but also of the time periods required for the effects to be observed and the relationship between baseline and treatment levels of performance. Barrios (in press) examined the effects of cue-controlled relaxation on a client who suffered from public speaking anxiety, difficulty falling asleep, and work performance anxiety. Although decrements in behavioral and self-report indices of anxiety were reported, differential rates of decreases across anxiety reactions occured. It is therefore imperative that information be obtained on the rate and variability of behavior changes produced by treatment. One possible method of arriving at this type of information would be to conduct a number of time series analyses (Campbell & Stanley, 1966) on clients who vary with respect to the nature, duration, and intensity of their anxiety reactions.

The present paper has examined the applicability of single subject designs for coping skills training research. The discussion has been confined primarily to investigations of coping skills training versus no-treatment, or comparasions of two or more coping skills training programs. To examine the relative effectiveness of traditional desensitization and coping skills training in a single subject, an A-B-C design may be employed. In such a design (with A= baseline, B=traditional desensitization, C=coping skills training), the behavior changes and generalization effects produced by intervention B could be compared to those obtained in phase C. It should be noted that interpretation of the results from this design does pose problems (Hersen & Barlow, 1976).

The purpose of the present paper was to assess the applicability of single subject designs for coping skills training research. Although few of the designs are accepable, some do offer promise as means of answering questions concerning the efficacy and generalization effects of coping

skills training. Eventually group designs should be employed to determine the active components of coping skills training. However at the present stage of development, single subject designs provide the most efficient means of obtaining information which is necessary before large scale group designs can be utilized.

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